
U.S. Department of the Interior • U.S. Geological Survey

MINERAL INDUSTRY SURVEYS

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PRECIOUS METALS IN SEPTEMBER 1997

U.S. mines produced 27,400 kilograms of gold and 150,000 kilograms of silver in September 1997. Production of silver was up by about 11% in Nevada and down by 15% in Arizona. Total silver production was up by about 5%.

Gold

Domestic.—Sabin Metal Corp., one of the largest privately owned precious metals refiners in the United States, has reached an agreement with Russia's Krasnoyarsk nonferrous metals plant. Krasnoyarsk, which accounts for about 95% of all the precious metals refined in Russia, uses as its feedstock a concentrate from the Norilsk nickel mining complex. Sabin will receive slags and other residues, process them, and ship back platinum, palladium, rhodium, and gold (Platt's Metals Week, 1997d).

Nevada Manhattan Mining Inc. has agreed with Vanderbilt Gold Corp. to buy and start up the Morning Star gold mine and vat-leach gold recovery facility, located in California, 70 miles southwest of Las Vegas, NV. Nevada Manhattan will make minor modifications to the processing plant before a 1998 start at about 25,000 troy ounces of gold per year. Morning Star's proven and probable reserves reportedly exceed 300,000 ounces of gold (Platt's Metals Week, 1997c).

International.—Tibet's first large-scale gold mine has gone into operation with output expected to average more than 12,000 ounces of gold per year (American Metal Market, 1997).

Peru's Cía Minera Sipan gold mine, which is located in the Yanacocha goldbelt 550 kilometers north of Lima, opened mid-October. The gold is extracted using heap-leaching and Merrill Crowe processing; the projected annual output is 120,000 ounces of gold by 1998. Sipan is expected to become Peru's third-largest gold mine (Metal Bulletin, 1997b).

Update.—Mining Journal reports that Metals Economics Group (MEG) estimates show Latin America as the main destination for nonferrous exploration expenditures, of which gold has gained a larger share each year since 1993. Spending

is strong in spite of the financing problems created by the Bre-X scandal and the weakness in the gold price. Latin America accounted for 29.0% of the \$4.03 billion budgeted by the 223 companies in MEG's annual survey, followed by Australia (16.7%), Africa (16.5%), Pacific and Southeast Asia (10.9%), Canada (10.8%), and the United States (9.1%) (Mining Journal, 1997b).

Starting January 1998, the Indian Government will authorize all agencies importing gold and silver into the country to sell gold on the domestic market. This latest move is aimed at boosting exports of gold and jewelry, and to bring into legal channels much of the present illegal financing of gold imports as a step towards capital-account convertibility. Imports will be subject to duty at only 5%; hence, the authorization, over time, will have a major impact on gold and silver prices and on the parallel market (Mining Journal, 1997a).

Gold prices plunged to \$307.30 on the October 24 COMEX market, the lowest level since March 18, 1985, when the price of gold dropped to \$303.30 per ounce. The selloff reportedly was sparked from news of a plan proposed by a Swiss-commissioned panel of financial experts to mobilize 54% of Switzerland's gold resources (1,400 metric tons). The gold reserves destined for sale are not required for monetary purposes, based on the Swiss's newly adjusted monetary policy (Platt's Metals Week, 1997a).

Silver

Silver Market Expands as Prices Rise to Six-Month High.

Trading in silver rose sharply in September on the London bullion market. Average daily turnovers increased to 314.3 million ounces in September from 263.3 million ounces in August, according to figures released by the London Bullion Market Association. This represented the highest level of trading since records were begun in October 1996. The average silver price rose from \$4.50 per ounce to \$4.73 per ounce, resulting in the daily value of silver turnovers rising by 25%

(Metal Bulletin, 1997c). In New York, silver prices rose above \$5.00 per ounce in both physical and futures markets. COMEX spot silver price rose 31.6¢ to \$5.10 per ounce on September 29, then on the following morning it rose further to \$5.1675 per ounce in London, the highest level in 6 months. The rally continued on the COMEX the same day, with spot prices rising to \$5.24 per ounce before it began to recede in subsequent days. Spot London silver fell to \$5.1525 per ounce on October 3 (Platt's Metal, 1997e).

Canadian Company Acquires Silver Mine in Mexico.—Canadian miner Pan American Silver has tentatively agreed to acquire 100% of the operating assets of the La Colorada silver mine, located in Zacatecas State, Mexico. The acquisition is contingent upon positive results from a 5,000-meter drilling program, commencing immediately. The drilling will cover 3,000 meters on the surface and 2,000 meters underground. Currently, the mine's output is 200 tons of ore per day with proven and probable reserves of 1.073 million tons, grading 489 grams-per-ton silver, 1.1% lead, and 1.1% zinc. The drilling is set to confirm existing reserves as well as test the reserve potential of several exploration targets and determine the economics of a plan to raise output to 600 tons per day or 2.5 million ounces of silver per year. The program is expected to be completed in early 1998 (Metal Bulletin 1997a).

Platinum-Group Metals

Zimbabwean Platinum Project Ships First Platinum.—The Australian minerals company BHP Minerals announced the first shipment of platinum-group metals (PGM) from its Hartley Mine in Zimbabwe. The mine is a 67:33 joint venture between manager BHP and Australia's Delta Gold. The PGM, in the form of a gray-black powder, have been shipped to England where they will be refined by Johnson Matthey. Shipments from Hartley are expected weekly, rising to twice a week as production increases. Full production from the mine is expected to be reached before the end of 1998. At full production, ore extraction reportedly will total 2.16 million metric tons per year, to produce 150,000 ounces per year platinum, 110,000 ounces of palladium, 11,500 ounces of rhodium, and 23,000 ounces of gold. At the same time, Delta Gold is on the verge of commissioning a feasibility study into another platinum deposit in Zimbabwe that could eventually lead to a mine bigger than the Hartley Mine. The Ngezi deposit, 50 kilometers south of Hartley, reportedly has sufficient resources to support a mine for 15 to 20 years with double the full production output of the Hartley Mine (Platt's Metals Week, 1997b).

Nanotubes Containing Platinum Prepared.—Nanosized carbon tubes filled with metal are known to have industrial applications as catalysts, nanowires for conducting electricity, and as composite materials. The preparation and structure of carbon nanotubes and the encapsulated metal determine the form that the active metal will take. Researchers at Tohoku University, Japan, have prepared uniform platinum-filled carbon nanotubes, with metal deposited only within channels. The researchers used a template method involving the electro-

oxidation of aluminum plate. The resulting aluminum oxide-film template was an array of parallel, straight channels of nanometer-scale diameter. Carbon was deposited on the channel walls by thermal decomposition of propene. Platinum was loaded onto this carbon film by impregnating it with an ethanol solution of hexachloroplatinic acid at room temperature. The chloroplatinic acid was then reduced to platinum in the channels by either heat treatment at 500°C under hydrogen or by stirring with excess NaBH₄ (sodium borohydride) solution at room temperature. The template was then removed with hydrofluoric acid, and a platinum metal/carbon nanotube composite was obtained (Platinum Metals Review, 1997).

Update: National Defense Stockpile Market Impact Committee Requests Public Comment on Potential Sales.—Washington, November 3—The National Defense Stockpile Market Impact Committee today published a *Federal Register* Notice (62 FR 56148, October 29, 1997) seeking public comment on the potential market impact on the proposed sale of excess platinum, palladium, and silver from the National Defense Stockpile. Under authority of the Strategic Materials Stockpiling Act, as amended, the Department of Defense (DOD) has a statutory obligation when selling or acquiring stockpile material to refrain from causing undue market disruption, while at the same time protecting the U.S. Government against avoidable loss. DOD has requested that the Committee, co-chaired by the Departments of Commerce and State, consider proposed sales quantities for the fiscal year 1999 Annual Materials Plan (AMP) and revisions to the fiscal year 1998 AMP. Public comments must be received by November 28, 1997, for the Committee to fully consider them during its upcoming AMP review.

The AMP listing includes the proposed maximum disposal quantities for each material. The proposed fiscal year 1999 quantity is 9 million ounces for silver (for coinage), 300,000 ounces for palladium, and 125,000 ounces for platinum. The quantity of material that will actually be offered for sale will depend on the market for the material at the time of the offering as well as prior Congressional approval. To obtain more information or a copy of the *Federal Register* Notice, please contact either of Committee co-chairs, Richard V. Meyers, Office of Strategic Industries and Economic Security, U.S. Department of Commerce at (202) 482-3634 or Fax (202) 482-5650, or Stephen H. Muller, Office of International Energy and Commodity Policy, U.S. Department of State at (202) 647-3423 or Fax (202) 647-8758.

NYMEX PGM Stocks.—New York, August 28—New York Mercantile Exchange warehouse stocks of platinum on this date totaled 43,000 ounces. Palladium stocks totaled 21,100 ounces.

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- 1997b, Peru's Sipan gold mine to open in mid-October: Metal Bulletin,

- no. 8220, October 16, p. 9.
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- Mining Journal, 1997a, India liberalises gold trade: Mining Journal, v. 329, no. 8452, October 24, p. 348.
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- Platinum Metals Review, 1997, Platinum nanorods in carbon nanotubes: Platinum Metals Review, v. 41, no. 3, p. 127.
- Platt's Metals Week, 1997a, COMEX gold prices plunge to 12-year low: Platt's Metals Week, v. 68, no. 43, October 27, p. 14.
- 1997 b, Hartley Platinum makes first shipment: Platt's Metals Week, v. 68, no. 43, October 27, p. 16.
- 1997c, Nevada Manhattan to start up mine: Platt's Metals Week, v. 68, no. 43, October 27, p. 16.
- 1997d, Sabin Metals strikes deal with Krasnoyarsk: Platt's Metals Week, v. 68, no. 42, October 20, p. 10.
- 1997e, Silver prices hit six-month highs as inventories drop: Platt's Metals Week, v. 68, no. 40, October 6, p. 15.

TABLE 1
MINE PRODUCTION OF RECOVERABLE GOLD AND SILVER IN THE UNITED STATES, BY STATE 1/

(Kilograms)

	Arizona	California	Montana	Nevada	Other States 2/	Total
Gold:						
1996:						
September	232	1,920	968	18,500	5,600	27,200
October	223	1,920	1,140	19,100	5,330	27,800
November	125	1,860	929	18,000	4,810	25,700
December	124	1,980	876	19,800	5,210	28,000
Jan.-Dec.	1,740	23,800	9,110	213,000	69,900	318,000
1997: p/						
January	W	1,800	948	18,500	5,600	26,900
February	W	1,800	659	16,400	5,430	24,300
March	W	1,850	671	20,400	5,310	28,200
April	W	1,850	618	18,900	5,730	27,100
May	102	1,830	640	19,700	5,970	28,300
June	74	1,770	W	21,000 r/	6,020	28,900 r/
July	W	1,790	648	20,600	5,620	28,600
August	W	1,800 r/	474	20,400	5,440	28,100
September	W	1,780	632	19,700	5,310	27,400
Jan.-Sept.	176	16,300	5,290	176,000	50,400	248,000
	Arizona	California	Idaho	Nevada	Other States 3/	Total
Silver:						
1996:						
September	13,000	1,330	18,000	57,200	37,500	127,000
October	12,500	1,450	18,600	67,700	35,800	136,000
November	13,900	1,340	17,700	48,900	32,200	114,000
December	14,100	1,250	17,800	58,300	34,800	126,000
Jan.-Dec.	188,000	21,600	229,000	605,000	530,000	1,570,000
1997: p/						
January	11,200	1,560	W	63,000	61,700	138,000
February	10,300	1,530	W	44,700	62,100	119,000
March	14,700	1,810	W	60,200	56,800 r/	133,000
April	12,600	2,110	W	56,500	62,900	134,000
May	13,500	1,880	W	45,400	67,700	128,000
June	14,600	1,720	W	58,800 r/	61,800	137,000
July	13,200	W	W	57,400 r/	60,800	131,000
August	14,900 r/	W	W	64,500 r/	62,700	142,000
September	12,600	W	W	71,500	65,400	150,000
Jan.-Sept.	118,000	10,600	W	522,000	496,000	1,210,000

p/ Preliminary. r/ Revised. W Withheld to avoid disclosing company proprietary data; included with "Other States."

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes Alaska, Colorado, Idaho, New Mexico, South Carolina, South Dakota, Utah, Wisconsin, and States indicated by symbol "W."

3/ Includes Alaska, Colorado, Michigan, Missouri, Montana, New Mexico, New York, South Carolina, South Dakota, Utah, Wisconsin, and States indicated by symbol "W."

TABLE 2
SELECTED PRECIOUS METAL PRICES

(Dollars per troy ounce)

	Gold	Silver	Platinum	Palladium
<u>Engelhard Industries:</u>				
<u>1996:</u>				
Low/date	368.67 (Dec. 03)	4.67 (Dec. 03)	368.00 (Dec.16)	117.00
High/date	391.06 (Aug .05)	5.82 (Feb. 02)	433.00 (Feb. 05)	146.00
Average	389.08	5.20	397.97	130.39
<u>1997:</u>				
<u>August:</u>				
Low/date	320.54/06	4.35/05	406.00/27	200.00
High/date	328.91/11	4.79/29	453.00/05	246.00
Average	325.24	4.52	426.23	221.57
<u>September:</u>				
Low/date	321.65/17	4.58/17	419.00/03	197.00
High/date	333.31/30	5.23/30	435.00/30	206.00
Average	323.91	4.74	425.95	200.38
<u>October:</u>				
Low/date	312.58/31	4.69/28	400.00/28	202.00
High/date	338.37/01	5.28/08	438.00/15	232.00
Average	326.07	5.02	424.73	214.21
<u>Year to date:</u>				
Low/date	312.58 (Oct. 31)	4.22 (July 08)	400.00 (Oct. 28)	177.00
High/date	367.82 (Jan. 01)	5.30 (Mar. 14)	490.00 (June 06 & 09)	246.00
Average	340.23	4.80	399.35	178.95
<u>Handy and Harman:</u>				
<u>1996:</u>				
Average	387.81	5.18	XX	XX
<u>1997:</u>				
August	324.03	4.51	XX	XX
September	322.74	4.72	XX	XX
October	324.87	5.00	XX	XX
Year to date	337.82	4.79	XX	XX
<u>London Final:</u>				
<u>1996:</u>				
Average	387.70	5.20	XX	XX
<u>1997:</u>				
August	324.01	4.49	XX	XX
September	322.82	4.73	XX	XX
October	324.87	5.04	XX	XX
Year to date	337.90	4.79	XX	XX

XX Not applicable.

Source: Platt's Metals Week.

TABLE 3
U.S. IMPORTS AND EXPORTS OF GOLD, BY COUNTRY 1/

(Kilograms of gold content, unless otherwise specified)

Country	Ores and concentrates 2/	Dore and precipitates	Refined bullion 3/	Total	Waste and scrap 4/ (gross weight)
Imports for consumption:					
1996	3,460	11,900	143,000	159,000	13,000
1997:					
June	345	662	12,300	13,300	1,440
July	72	908	17,100	18,100	1,060
August:					
Brazil	--	--	2,600	2,600	--
Canada	4	141	5,460	5,610	23
Chile	2	--	973	975	--
Colombia	--	--	336	336	156
Dominican Republic	--	--	63	63	334
Mexico	78	547	209	834	150
Netherlands Antilles	--	--	159	159	60
Peru	--	--	1,260	1,260	2
Switzerland	--	--	1,100	1,100	--
Uruguay	--	--	255	255	--
Other	--	72	547	619	306
Total	84	760	13,000	13,800	1,030
Year to date	1,380	9,320	131,000	142,000	8,120
Exports:					
1996	374	65,100	406,000	471,000	89,900
1997:					
June	--	5,990	57,400	63,400	4,900
July	83	4,750	17,600	22,500	4,010
August:					
Canada	6	620	55	682	3,080
France	--	--	--	--	992
Germany	--	--	3	3	197
Hong Kong	--	1,000	--	1,000	--
Korea, Republic of	--	--	202	202	--
Mexico	--	--	1,360	1,360	--
Switzerland	--	5,650	6,100	11,700	--
United Kingdom	--	2,870	5,840	8,700	1,090
Other	--	2	929	931	317
Total	6	10,100	14,500	24,600	5,670
Year to date	278	47,200	323,000	371,000	38,700

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes gold content of base metal ores, concentrates, and matte imported for refining.

3/ Bullion also moves in both directions between U.S. markets and foreign stocks on deposit in the Federal Reserve Bank. Monetary gold excluded.

4/ "Waste and scrap" not included in "Total."

Source: Bureau of the Census.

TABLE 4
U.S. IMPORTS AND EXPORTS OF SILVER, BY COUNTRY 1/

(Kilograms of silver content, unless otherwise specified)

Country	Ores and concentrates 2/	Dore and precipitates	Refined bullion	Total	Waste and scrap 3/ (gross weight)
Imports for consumption:					
1996	153,000	281,000	2,580,000	3,010,000	1,810,000
1997:					
June	21,200	21,900 4/	189,000	233,000	183,000
July	12,300	24,200 4/	159,000	196,000	68,000
August:					
Canada	83	--	73,800	73,900	11,300
Chile	90	4,750	1,060	5,890	93
Dominican Republic	--	--	--	--	55
Germany	--	--	--	--	19,500
Malaysia	--	--	--	--	27,100
Mexico	14,900	200	84,800	99,900	233
Peru	--	1,350	30,300	31,700	8,930
Philippines	--	--	--	--	19
Poland	--	--	9,970	9,970	--
United Kingdom	--	--	--	--	20,800
Other	--	143	--	142	213
Total	15,100	6,430	200,000	222,000	88,200
Year to date	97,300	209,000	1,370,000	1,680,000	952,000
Exports:					
1996	1,520	43,300	2,900,000 5/	2,950,000	1,280,000
1997:					
June	--	6,470	941,000	947,000	78,200
July	13,200	3,070	223,000	239,000	79,400
August:					
Belgium	--	--	--	--	4,170
Canada	--	--	65	65	29,400
China	--	890	--	890	2,080
Germany	--	--	60	60	6,760
Japan	--	--	--	--	18,500
Sweden	--	--	--	--	1,700
Taiwan	--	1,670	--	1,670	--
United Arab Emirates	--	--	201,000	201,000	--
United Kingdom	--	--	--	--	9,170
Other	--	--	--	--	1,280
Total	--	2,560	202,000	204,000	73,100
Year to date	29,000	50,400	1,800,000	1,880,000	634,000

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes silver content of base metal ores, concentrates, and matte imported for refining.

3/ "Waste and scrap" not included in "Total."

4/ All or part of these data have been referred to the Bureau of the Census for verification.

5/ Verification of Bureau of the Census exports was not possible for some months of 1996.

Source: Bureau of the Census.

TABLE 5
U.S. IMPORTS AND EXPORTS OF PLATINUM-GROUP METALS, BY COUNTRY 1/

(Kilograms of metal content, unless otherwise specified)

Country	Ores and concentrates	Waste and scrap (gross weight)	Refined					Osmium	Ruthenium
			Platinum	Palladium	Rhodium	Iridium			
Imports for consumption:									
1996	1,960	5,060	73,700 2/	146,000	9,650	1,810	329	15,600	
1997:									
June	--	591	5,820	8,240	628	61	--	293	
July	--	408	6,070	10,600	828	217	18	519	
August:									
Belgium	--	--	231	1,490	30	--	--	--	
Canada	--	24	236	234	--	--	--	--	
China	--	--	--	186	--	--	--	--	
France	--	191	--	--	--	--	--	--	
Germany	--	--	413	685	36	60	--	62	
Hong Kong	--	54	--	--	--	--	--	--	
Japan	--	--	--	1,010	--	--	--	--	
Norway	--	--	53	191	--	--	--	--	
Russia	--	--	40	3,970	--	--	--	53	
South Africa	--	--	2,980	1,800	479	27	--	905	
Switzerland	--	--	447	759	130	14	--	16	
United Kingdom	--	243	339	1,550	99	46	--	44	
Other	--	46	152	47	3	--	--	--	
Total	--	560	4,890	11,900	777	147	--	1,080	
Year to date	--	3,580	48,800	70,400	5,140	1,050	36	7,670	
Exports:									
1996	484	8,640	12,700	26,700	196	123 3/			
1997:									
June	50	1,730	2,900	5,320	54	32 3/			
July	58	1,660	4,160	2,880	59	2 3/			
August:									
Australia	--	--	469	2	--	--			
Belgium	--	15	723	643	--	--			
Canada	--	--	124	1,370	--	2 3/			
France	--	--	3	3	--	--			
Germany	8	718	21	84	--	--			
Hong Kong	--	--	1	--	--	--			
Ireland	--	--	37	38	--	--			
Italy	--	--	--	2	--	--			
Japan	4	60	30	206	--	4 3/			
Korea, Republic of	--	--	55	157	4	--			
Mexico	--	--	9	783	--	--			
Netherlands	--	--	7	109	--	--			
South Africa	--	--	--	1	--	--			
Switzerland	10	--	514	36	--	--			
Taiwan	--	--	6	563	--	1 3/			
United Kingdom	15	609	373	106	--	--			
Other	7	11	59	43	--	1 3/			
Total	44	1,410	2,430	4,140	4	8 3/			
Year to date	525	9,510	16,900	30,600	139	450 3/			

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Of this amount, 2,070 kilograms was in the form of platinum coins.

3/ Includes osmium and ruthenium.

Source: Bureau of the Census.